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Prepared by Caroline D. Bösch, Markus Probst, Yuliia Vyborna, Mykhailo Vybornyi, Simon M. Langenegger and Robert Häner*

**YAIC: A Bonding Chameleon with Heteropolyacetylene Features**

Silicon carbide and aluminium carbide are extremely stable refractory compounds demonstrating the strength of the Si–C and the Al–C bonds, respectively. Kotyrba, Cuervo-Reyes and Nesper describe a novel ternary aluminide–carbide, YAIC, which was prepared by a flux method. It crystallizes as a partially filled-up TlI structure, showing remarkable structural aspects at the border between Zintl phases and intermetallics. The compound represents a fascinating compromise between the polarized metal (stuffed intermetallic) and the semicovalent Y⁺[AlC]⁻ model.

A key feature is the coexistence of two-centre and multi-center bonds. The latter appear as tapes meandering wherever there would be a direct Al–Al or Y–Al contact, and contain the residual electron density after the formation of the Al-C semi-covalent chains.

**3d–4f {Co³ Ln(OR)} Cubanes as Bio-Inspired Water Oxidation Catalysts**

The {CaMn₃O₄} oxygen evolving complex of photosystem II represents a major paradigm for the development of water oxidation catalysts (WOCs). However, translating its key features into active molecular WOCs remains a major challenge.

Patzke, Lubér and co-workers now introduce {Co³Ln(hmp)(OAc)₃H₂O/Co³Ln(OR)₃} cubanes as new functional and stable model systems to explore a range of crucial design parameters, including core nuclearity, redox-inactive promoters, and ligand exchange properties. The highly active {Co³Ln(OR)₃} cubanes advance promote bio-inspired design through the combination of Ln³⁺ core cations as redox-inactive Ca³⁺ analogues of nature’s oxygen evolving complex with flexible aqua/-aceta ligands. The Ln³⁺-enhanced ligand exchange of the {Co³Ln(OR)₃} WOCs is substantiated with molecular dynamics studies.

**Structure and Mechanism of an Active Lipid-linked Oligosaccharide Flippase**

The flipping of membrane-embedded lipids containing large, polar head groups is slow and energetically unfavourable, and is therefore catalysed by flippases, the mechanisms of which are unknown. A prominent example of a flipping reaction is the translocation of lipid-linked oligosaccharides that serve as donors in N-linked protein glycosylation. In Campylobacter jejuni, this process is catalysed by the ABC transporter PglK. Locher and coauthors present a mechanism of PglK-catalysed, lipid-linked oligosaccharide flipping based on crystal structures in distinct states, a newly devised in vitro flipping assay, and in vivo studies. The proposed mechanism is distinct from the classical alternating-access model observed in other transporters.

**Synthesis of Fijiolide A via an Atropselective Paracyclophane Formation**

C. Heinz and N. Cramer*, J. Am. Chem. Soc. 2015, 137, 11278. EPF Lausanne
Fijiolide A is a secondary metabolite isolated from a marine-derived actinomycete displaying inhibitory activity against TNF-α-induced activation of NFκB, an important transcription factor and a potential target for the treatment of different cancers and inflammation related diseases. Fijiolide A is a glycosylated complex paracyclophane, which is structurally closely related to the Bergman-aromatization product of enediyne C-1027. Cramer and Heinz report an enantioselective synthesis of fijiolide A demonstrating the power of fully intermolecular ruthenium-catalysed [2+2+2]-cyclotrimerizations with three different alkynes to assemble the heavily substituted central arene core. The characteristic strained [2,6]-paracyclophane structure is accessed by a templated atropselective macrothertification reaction.